

REMARKS

In the Office Action dated July 27, 2009 (the “Office Action”), claims 1, 4, 5, 6, 15, 18, 19, and 21 were rejected pursuant to 35 U.S.C. § 102(b) as being anticipated by Marian (U.S. Patent No. 5,913,688). Claims 8, 12, 22, and 26 were rejected pursuant to 35 U.S.C. § 103(a) as being unpatentable over Marian in view of Rockwood et al. (U.S. Patent No. 6,316,768). Claims 9 – 11 and 23 – 25 were rejected pursuant to 35 U.S.C. § 103(a) as being unpatentable over Marian in view of Powell (U.S. Patent No. 6,931,723). Claims 13 and 27 were rejected pursuant to 35 U.S.C. § 103(a) as being unpatentable over Marian in view of Rockwood et al. and Tilton et al. (U.S. Patent No. 6,108,201). Claims 14 and 28 were rejected pursuant to 35 U.S.C. 103(a) as being unpatentable over Marian in view of Kaczmarek et al. (U.S. Patent No. 6,542,577).

Applicant respectfully requests reconsideration, in light of the claim amendments presented above and the following remarks, of the claim rejections set forth in the Office Action.

I. Summary of Telephonic Interview

Applicants thank Examiner Chen for the telephonic interview dated October 26, 2009 with Applicant’s Agent, Jay Knobloch. During the interview, proposed claim amendments were discussed in light of the current claim rejections. The Examiner explained that the proposed claim amendments would overcome the 35 U.S.C. § 102(b) claim rejections; however, he would need to consider whether the proposed claim amendments overcame the other cited references. Although a formal agreement was not reached, the telephonic interview was beneficial for Applicant’s Agent.

II. Claim Rejections - 35 U.S.C. § 102(b)

Claims 1, 4, 5, 6, 15, 18, 19, and 21 were rejected pursuant to 35 U.S.C. § 102(b) as being anticipated by Marian (U.S. Patent No. 5,913,688).

Amended claim 1 recites at least first and second layers being configured without a continuous opening such that the printed circuit board is a liquid-tight closure that prevents the coolant oil from flowing outside of the housing. Amended claim 15 recites that the printed circuit board having no continuous opening such that the printed circuit board is a liquid-tight closure that prevents the coolant oil from flowing to the outside of the housing.

As discussed during the telephonic interview, Marian fails to disclose at least first and second layers of a printed circuit board being configured without a continuous opening such that the printed circuit board is a liquid-tight closure that prevents the coolant oil from flowing outside of the housing. Marian discloses a connector system for use with ultrasound imaging probes. The connector system is configured as a plug to be connected to an ultrasound imaging system (*See*, e.g., Figs 6A and 6B). The connector includes a housing that is configured to prevent corrosive fluids and steam from entering the housing in order to be submersible in liquids like pre-cleaning solutions (*See*, e.g., Abstract and column 4, lines 36 to 44). Accordingly, Marian teaches away from at least first and second layers of a printed circuit board being configured without a continuous opening such that the printed circuit board is a liquid-tight closure that prevents the coolant oil from flowing outside of the housing. Therefore, claim 1 is allowable over the cited reference.

Dependent claims 4, 5, 6, 18, 19, and 21 depend from allowable claims 1 and 15 and are allowable for at least this reason.

III. Claims Rejection – 35 U.S.C. § 103(a)

Claims 8, 12, 22, and 26 were rejected pursuant to 35 U.S.C. § 103(a) as being unpatentable over Marian in view of Rockwood et al. (U.S. Patent No. 6,316,768). Claims 9 – 11 and 23 – 25 were rejected pursuant to 35 U.S.C. § 103(a) as being unpatentable over Marian in view of Powell (U.S. Patent No. 6,931,723). Claims 13 and 27 were rejected pursuant to 35 U.S.C. § 103(a) as being unpatentable over Marian in view of Rockwood et al. and Tilton et al. (U.S. Patent No. 6,108,201). Claims 14 and 28 were rejected pursuant to 35 U.S.C. 103(a) as being unpatentable over Marian in view of Kaczmarek et al. (U.S. Patent No. 6,542,577).

As discussed below, Rockwood et al., Powell, Tilton et al., Kaczmarek et al. fail to disclose at least first and second layers of a printed circuit board being configured without a continuous opening such that the printed circuit board is a liquid-tight closure that prevents the coolant oil from flowing outside of the housing.

Marian is discussed above.

Rockwood et al. sets forth:

The present invention is embodied in a method and apparatus for utilizing inherently insulative material, such as the glass and epoxy resins used in construction of printed circuit boards, for construction of components in a time of flight mass spectrometer. By using printed circuit board materials, the present invention can take advantage of fabrication techniques for providing circuit traces on surfaces, from one side to another as a via, or embedded within the printed circuit material so as to be covered except where necessary to be exposed to make contact with other electrical devices. Embedded circuit traces also enable capacitive coupling to AC energy while maintaining electrical and physical isolation. Consequently, the present invention enables both invasive and non-invasive access to pressure and vacuum chambers.

See, Rockwood et al., Abstract.

Powell sets forth:

A method for making a multi-layer electronic structure. A layer of dielectric material having a top surface and a bottom surface is provided. A layer of electrically conducting material is provided on one of the top surface and the bottom surface of the dielectric layer. At least one passage is formed through the dielectric layer to expose the layer of electrically conducting material. Electrically conducting material is deposited in at least one of the at least one passage through the dielectric layer. Portions of the layer of electrically conducting material are removed to define a pattern of circuitry. A stack is formed of plurality of structures including the layer of dielectric material and layer of electrically conducting material. The plurality of structures are aligned and joined together. Spaces between the structures are filled with electrically insulating material.

See, Powell, Abstract.

Tilton et al. sets forth:

A fluid control apparatus is adapted for use with a spray plate 100 having at least one atomizer 120 which cools an associated printed circuit board 200 carrying one or more heat-generating components such as integrated circuits 220. At least one spray plate and printed circuit board are carried within a coolant-tight enclosure such as a spray module 300. A preferred shroud 20 is supported by the spray plate. The shroud encloses a spray cavity 24 and provides control over the flow and direction of the spray coolant leaving the atomizers enclosed by the shroud. Control over the flow and direction of the coolant spray better cools the components carried on the printed circuit board and partially enclosed by the shroud.

See, Tilton et al., Abstract.

Kaczmarek et al. sets forth:

A connection device (70) provides electrical connection between a stator motor (50) of an x-ray tube and a stator cord (56). The connection device is connected with the x-ray tube housing (30) by threading a threaded portion (80) into a corresponding threaded aperture (82) in the housing to create a leak-tight seal. The threaded portion is rigidly connected with a connecting portion (100), such as a bayonet socket, which receives a corresponding fitting (102) the stator cord. An electrical conduction path (125), hermetically sealed in the connecting device, provides electrical connection between the socket and the interior of the housing. The connection device allows the stator cord to be quickly connected or disconnected from the housing yet provides a seal which resists leakage cooling oil from the housing.

See, Kaczmarek et al., Abstract.

As discussed during the telephone interview, Kaczmarek et al. fails to disclose at least first and second layers of the printed circuit board being configured without a continuous opening such that the printed circuit board is a liquid-tight closure that prevents the coolant oil from flowing outside of the housing. In contrast to claim 1, Kaczmarek et al. disclose a single layered wall 76 of the housing. The wall 76 does not include first and second layers without a continuous opening. In fact, in direct contrast to claim 1, the wall 76 includes a tapped aperture 82 (*See*, e.g., col. 3, lines 40-50 and Fig. 7). The tapped aperture 82 is plugged with a connection device 70. Accordingly, the wall 76 has a continuous opening.

One benefit of using a printed circuit board with first and second layers without a continuous opening is that the housing has a simplified design (*See*, e.g., Original Specification, Paragraph [0003], [0004], and [0012]). However, Kaczmarek et al. disclose the use of additional components that involve relatively great effort to produce and thus are expensive (*See*, e.g., Original Specification, Paragraph [0003]). Accordingly, as discussed on the telephone, the independent claims would not have been obvious in light of Kaczmarek et al.


Claims 8 - 14, 22 - 28 depend from allowable claims 1 and 15 and are allowable for at least this reason.

Conclusion

For at least the reasons presented above, the Applicant respectfully submits that the pending claims are in condition for allowance.

The Examiner is respectfully requested to contact the undersigned in the event that a telephone interview would expedite consideration of the application.

Respectfully submitted,


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